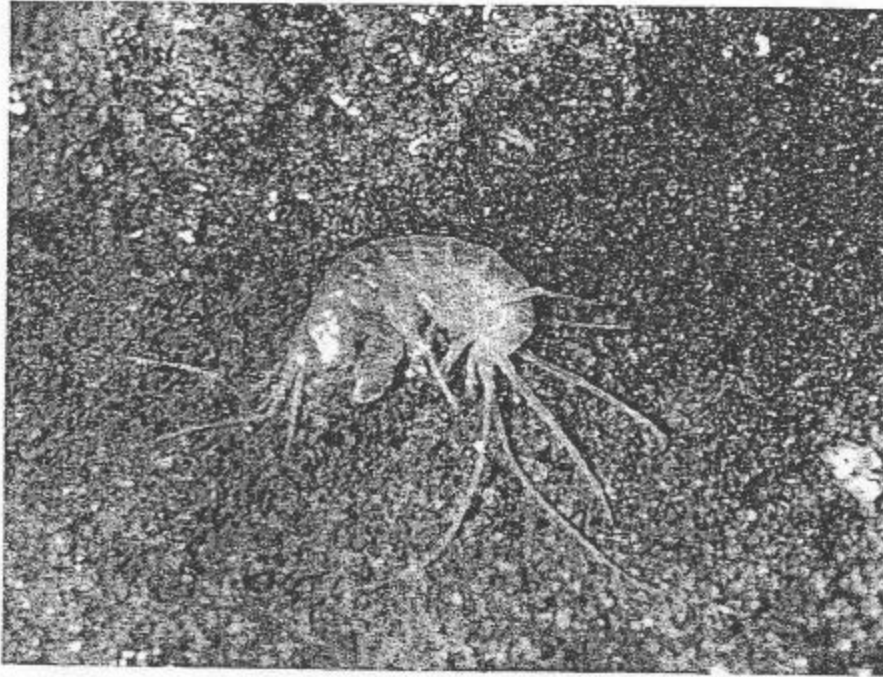


*Conservation Assessment
for
Hubricht's Long-Tailed Amphipod (Allocrangonyx Hubrichti)*



(From Gardner, 1986)

USDA Forest Service, Eastern Region

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MARK TWAIN NATIONAL FOREST



This Conservation Assessment was prepared to compile the published and unpublished information on Allocrangonyx hubrichti. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject community and associated taxa, please contact the Eastern Region of the Forest Service Threatened and Endangered Species Program at 310 Wisconsin Avenue, Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

The Hubricht's long-tailed amphipod is designated as a Regional Forester Sensitive Species on the Mark Twain National Forest in the Eastern Region of the Forest Service. The purpose of this document is to provide the background information necessary to prepare a Conservation Strategy, which will include management actions to conserve the species.

The Hubricht's long-tailed amphipod is a rare amphipod crustacean known from seven caves and springs in east-central Missouri and one well in northcentral Arkansas.

NOMENCLATURE AND TAXONOMY

Classification:	Class Crustacea Order Amphipoda Family Allocrangonyctidae
Scientific Name:	<u>Allocrangonyx hubrichti</u> Holsinger
Common Name:	Hubricht's long-tailed amphipod
Synonyms:	none

This species was described by Holsinger (1971), with a long, detailed written description accompanied by three pages of illustrations.

Allocrangonyx was previously placed in the Family Gammaridae (Holsinger, 1971). Bousfield (1973; 1977) and Holsinger (1977) subdivided this large, heterogeneous family into a number of smaller families, placing Allocrangonyx in the Family Crangonyctidae. Holsinger (1986a, 1986b) however, recognized the dissimilarity of Allocrangonyx to the other members of the Crangonyctidae. Subsequently, Holsinger (1989) described the new family Allocrangonyctidae and placed the two species of Allocrangonyx in it.

DESCRIPTION OF SPECIES

This is a relatively large, eyeless, unpigmented (white) amphipod crustacean, characterized by males with the third uropod exceeding the length of the body of the animal (Holsinger, 1971; 1972). Technically, identification of this species requires laboratory dissection and examination of slide-mounted appendages under a compound microscope by a specialist in amphipod taxonomy. From a practical standpoint amphipods in which the third uropod is fully developed are probably recognizable in the field, since this is the only species within its range with this characteristic.

LIFE HISTORY

Of seven specimens collected in the type series in October, one female was ovigerous and measured 14.5mm length and had 5 embryos in the brood pouch. The embryos averaged 1.15mm in diameter (Holsinger, 1971). Developmental changes that occur in the third uropod are incredible and have been discussed at length by Holsinger (1971, 1989). In males in particular the outer ramus of the third uropod differentiates into secondary segments with the total length of the third uropod attaining a size longer than the body of the amphipod. Although no observations have been made of the

reproductive behavior of these amphipods, it was suggested by Holsinger (1989) that this hyperextended third uropod might have a mating function of some sort.

HABITAT

This species is known only from caves, a spring (Holsinger, 1971, 1989) and one well (Robison and Holsinger, 2000). Gardner (1986) reported finding the amphipod beneath boards in a stream pool in one cave, while it was found beneath stones in another cave stream.

DISTRIBUTION AND ABUNDANCE

Allocrangonyx hubrichti is known from three counties in east-central Missouri and a disjunct locality in White County, Arkansas 283 km (175 miles) to the south. This amphipod is quite rare. Gardner (1986) reported that two exhaustive collecting trips to Great Spirit Cave failed to rediscover Allocrangonyx hubrichti in the cave. A single specimen was found in Kaintuck Hollow Natural Bridge Cave.

RANGEWIDE STATUS

Global Rank: G2 imperiled; The global rank of G2 typically includes species that are known globally from between 6 and 20 localities. Allocrangonyx hubrichti is known from eight localities, which would normally give this species a global rarity rank of G2. However, the inability to demonstrate the continued existence of the species in one site and the overall presumptive low population size suggests a G-rank of G1 would be more appropriate.

Missouri State Rank: S2 imperiled; Similarly, S2 includes species that are known from between 6 and 20 localities in Missouri. Of the eight localities from which this species is reported all but one are in Missouri. Again, an S-rank of S1 might be more appropriate for this species.

POPULATION BIOLOGY AND VIABILITY

Nothing is known of the population biology of this species.

POTENTIAL THREATS

It has been suggested by Gardner (1986) that additional collecting of this extremely rare species from known locations should not be done. Other known specific threats have not been recorded.

There are numerous potential threats that might reasonably occur on national forest land due to the presence of Allocrangonyx hubrichti in the restricted cave and groundwater environment. These include problems caused by activities outside of forest owned properties that may be imported by surface runoff or groundwater flow. Potential contaminants include (1) sewage or fecal contamination, including sewage plant effluent, septic field waste, campground outhouses, feedlots, grazing pastures or any other source of human or animal waste (Harvey and Skeleton, 1968; Quinlan and Rowe, 1977, 1978; Lewis, 1993; Panno, et al 1996, 1997, 1998); (2) pesticides or herbicides used for crops, livestock, trails, roads or other applications; fertilizers used for crops or lawns (Keith

and Poulson, 1981; Panno, et al. 1998); (3) hazardous material introductions via accidental spills or deliberate dumping, including road salting (Quinlan and Rowe, 1977, 1978; Lewis, 1993, 1996). Gardner (1986) reported the destruction of large numbers of aquatic animals in the Meramec Spring conduit by a spill of ammonium nitrate. This chemical spill resulted in the dissolved oxygen at the spring dropping to <0.5ppm.

Habitat alteration due to sedimentation is a pervasive threat potentially caused by logging, road or other construction, trail building, farming, or any other kind of development that disturbs groundcover. Sedimentation potentially changes cave habitat, blocks recharge sites, or alters flow volume and velocity. Keith (1988) reported that pesticides and other harmful compounds like PCB's can adhere to clay and silt particles and be transported via sedimentation.

There is a long history of mineral (e.g., zinc, lead) exploration and development in the southeastern and east central Ozarks and groundwater contamination is a potential threat. Dewatering of karst systems by well drawdown and mine pumping may also be a threat to groundwater species.

With the presence of humans in caves comes an increased risk of vandalism or littering of the habitat, disruption of habitat and trampling of fauna, introduction of microbial flora non-native to the cave or introduction of hazardous materials, e.g., spent carbide, batteries (Peck, 1969; Elliott, 1998). The construction of roads or trails near cave entrances encourages entry.

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

Allocrangonyx hubrichti occurs in the following caves on the Mark Twain National Forest: Kaintuck Hollow Natural Bridge Cave, Phelps Co.; Killman Cave, Pulaski Co. Mossy Spring Cave, Washington County is on the land of the Missouri Department of Conservation.

SUMMARY OF MANAGEMENT AND CONSERVATION ACTIVITIES

No species specific management activities are being conducted concerning Allocrangonyx hubrichti.

Caves and springs located on the Mark Twain National Forest are subject to Forest Plan standards and guidelines for cave and spring protection and management. Perennial springs and spring branches will have a minimum 100 foot buffer zone within which any treatment will be modified on a case-by-case basis to: (1) meet state water quality standards and regulations, (2) comply with the riparian zone standards and guidelines identified under forest-wide 2500 (water and soil resource management) and 2600 (wildlife habitat management), (3) protect visual aspects, and (4) protect and enhance natural plant and animal communities. Similar guidelines exist for the management of seeps and fens.

Caves in the Mark Twain National Forest are recognized as specialized habitat areas and will be managed in accordance to the recommendations established by Gardner in 1982 in "An Inventory and Evaluation of Cave Resources of the Mark Twain National Forest". This includes the designation of an area of at least five acres centered on and completely surrounding a cave entrance for permanent old growth management. Insecticides and herbicides will not be used within the

surface and known subsurface watersheds of caves utilized by the Indiana or Gray bats, Ozark cavefish, or any state endangered or rare species.

RESEARCH AND MONITORING

No species specific research or monitoring activities are being conducted concerning Allocrangonyx hubrichti.

RECOMMENDATIONS

Retain on list of Regional Forester Sensitive Species.

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